

**INITIAL STUDY,
ENVIRONMENTAL
CHECKLIST AND
PROPOSED NEGATIVE
DECLARATION**

**AB 970 Energy Efficiency
Standards for Residential
and Nonresidential Buildings**

January 3, 2001

STAFF REPORT

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Gray Davis, Governor

CALIFORNIA ENERGY COMMISSION

Elaine Hebert

Rob Hudler

Principal Authors

Tony Rygg

Project Manager, CEQA

Scott Matthews

Deputy Director

Energy Efficiency Division

Steve Larson,

Executive Director

California Energy Commission

INITIAL STUDY, ENVIRONMENTAL CHECKLIST AND PROPOSED NEGATIVE DECLARATION

AB 970 ENERGY EFFICIENCY STANDARDS FOR RESIDENTIAL AND NONRESIDENTIAL BUILDINGS

Energy Commission Publication No. P 400-01-007

This report fulfills the requirements of the California Environmental Quality Act (CEQA) which requires public agencies to identify and consider the environmental effects of their "projects," as that term is defined, and when feasible to mitigate any related adverse environmental consequences. The Energy Commission's adoption of regulations is a project as defined under CEQA.

This report is intended for use as a discussion topic at an Energy Efficiency Committee hearing to be held at the California Energy Commission on February, 5, 2001. The hearing purpose is to obtain public comment on possible revisions to the Title 24 Building Energy Efficiency Standards (California Code of Regulations, Title 24, Part 6).

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January 19, 2001

INITIAL STUDY
and
ENVIRONMENTAL CHECKLIST

AB 970 ENERGY EFFICIENCY STANDARDS
FOR RESIDENTIAL AND NONRESIDENTIAL BUILDINGS

CALIFORNIA ENERGY COMMISSION

November 20, 2000
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TABLE OF CONTENTS

I. Background	1
A. History of the Standards	1
B. Reasons for this Project	1
II. Proposed Project	2
III. No Project	3
IV. Energy and Environmental Impacts of Proposed Changes	5
A. Energy Impacts	5
B. Environmental Impacts	6
V. Conclusions and Recommendations	8
VI. Environmental Checklist	9
Appendix A – Summary of Proposed Changes to Residential and Nonresidential Building Energy Efficiency Standards under AB 970	
Appendix B – References	
Appendix C – Glossary of Terms	

AB 970 ENERGY EFFICIENCY STANDARDS FOR RESIDENTIAL AND NONRESIDENTIAL BUILDINGS

I. BACKGROUND

A. History of the Standards

The California energy efficiency standards were established to ensure that buildings are constructed, and that their related systems are designed and installed, to use energy efficiently while preserving outdoor and indoor environmental quality. These standards establish a *minimum* level of building energy efficiency. A building can be designed to a higher efficiency level, resulting in additional energy savings.

The energy efficiency standards are aimed at the major building components that impact energy uses in new residential and nonresidential buildings, additions and alterations: lighting, water heating, and space conditioning systems, and the building envelope. These standards are fundamentally performance standards requiring buildings to meet allowable energy budgets, providing flexibility for what features are chosen to comply. The standards also include prescriptive alternatives and some mandatory requirements. Compliance with energy standards must be demonstrated to the local permitting agency, usually a city or county Building Department, before an occupancy permit is issued.

Since 1975, the standards (along with standards for energy efficient appliances) have helped Californians save more than \$15.8 billion in electricity and natural gas costs. Energy Commission analysts estimate that that number will climb an additional \$43 billion by 2011.¹ These savings and energy use reductions result in environmental benefits not only in California, but also in other parts of the Western United States from which California imports energy.

The Energy Commission amends the building standards periodically, usually every three years, to account for improvements in energy efficiency technologies, changes in the cost of fuels and energy-conserving strategies, and improved building science research findings and understanding of California building energy performance. The Commission must determine that the standards and any changes thereto are cost-effective.

B. Reasons for This Project

During the year 2000, California experienced an electricity supply alert on 32 hot days between May 21 and September 21. During the hottest times of the day, approximately noon to 8 p.m., air conditioners all over the state put a strain on the electricity supply system. With surrounding states suffering in the heat as well, and few new power plants built in recent years, compounded by several years of significant population and economic growth in the West, the major electric utilities in California reported that reserve margins of electricity grew dangerously small. Stage One or Two alerts² were called on these “Power Watch” days,

¹ Cited on the California Energy Commission’s website, <http://www.energy.ca.gov/title24/index.html>.

² A Stage One Emergency takes effect when electricity operating reserves fall below seven percent. A Stage Two is declared when reserves fall below five percent; large commercial customers who volunteer to curtail power at times of high demand are asked to do so. A Stage Three is declared when reserves are less than one and a half percent. Utilities sometimes initiate rolling blackouts to preserve grid integrity.

citizens and companies were asked to conserve, and the utilities implemented a variety of emergency measures to help alleviate the strain.

On these days, the utilities experienced high acquisition prices for electricity on the wholesale market. In the San Diego region, electricity bills doubled and in some cases tripled because rates were no longer subject to the rate freeze implemented in electric utility restructuring.

On September 6, 2000, Governor Gray Davis signed emergency legislation, Assembly Bill 970, the California Energy Security and Reliability Act of 2000. The purpose of this legislation was to provide a balanced response to the state's electricity problems, to create significant investments in new, environmentally superior electricity generation, and to increase new investments in conservation and demand-side management programs to meet future energy needs.

One of the AB 970 mandates was to adopt and implement amendments to Title 24, Part 6 of the California Code of Regulations, the energy efficiency standards for residential and nonresidential buildings. The directive for the building standards was to incorporate cost-effective building energy efficiency measures that would reduce electricity demand in hot weather (usually over 100° F) and provide for more efficient use of electricity. AB 970 mandated that the Commission adopt and implement the new standards in 120 days or on the earliest feasible date thereafter.

Further, the California Environmental Quality Act (Public Resources Code, Sections 21000 et seq.), referred to as "CEQA," requires public agencies to identify and consider the environmental effects of their "projects," as that term is defined, and when feasible to mitigate any related adverse environmental consequences. The Energy Commission's adoption of regulations is a project as defined under CEQA. The Commission has therefore included in this Initial Study the results of analyses to determine any significant effects of the proposed efficiency standards amendments on the environment.

II. PROPOSED PROJECT

With input from outside stakeholders, Energy Commission staff identified a number of measures for consideration as changes to Title 24, Part 6, in response to AB 970. After review and analysis, and with assistance from outside energy consultants, Commission staff propose these changes (a more detailed list of the proposed measures is included in Appendix A):

Residential Buildings

- Revise the energy performance standards and prescriptive alternatives to be based on the following:
- Low solar gain glazing, for climate zones 2, 4, and 7-15, low-emissivity (LSLE) glazing for climate zones 10-15 (see Figure 1 for a map of the sixteen California climate zones)
- Duct sealing in all climate zones
- Thermostatic expansion valves (TXVs) on new central air conditioners in climate zones 2 and 8-15
- Radiant barriers in climate zones 2, 4, and 8-15
- Eliminate the compliance credit for interior shading devices in all climate zones
- Extend the duct efficiency compliance credits to multi-family buildings

- Create a compliance credit for “cool roofs” (reflective roofs)
- Change modeling assumptions for the base building to reflect typical refrigerant charge, air flow, fan wattage and temperature dependent performance of air conditioners and heat pumps

Nonresidential Buildings

- Adopt measures from ASHRAE 90.1 that are more efficient than 1998 Title 24, Part 6
- Improve fenestration (window) U-value and SHGC performance requirements
- Reduce lighting power densities for some building spaces
- Remove blanket exemption for bi-level switching when occupancy sensors or automatic controls are installed and for buildings smaller than 5,000 square feet
- Establish requirements for exterior lighting efficiency
- Delete lumen maintenance control credits
- Allow trade-offs for using higher efficiency cooling systems instead of air-side economizers
- Limit the types of controls used on air-side economizers
- Increase efficiency requirements for space conditioning and water heating equipment
- Establish compliance credit for “cool roofs”
- Explicitly require protection for duct and pipe insulation installed exterior to buildings
- Require rating and labeling for site-built fenestration in large buildings
- Require demand control ventilation for assembly occupancies
- Clarify lighting compliance requirements for open offices with furniture-based lighting
- Establish compliance credit for duct sealing and insulation for package rooftop HVAC systems

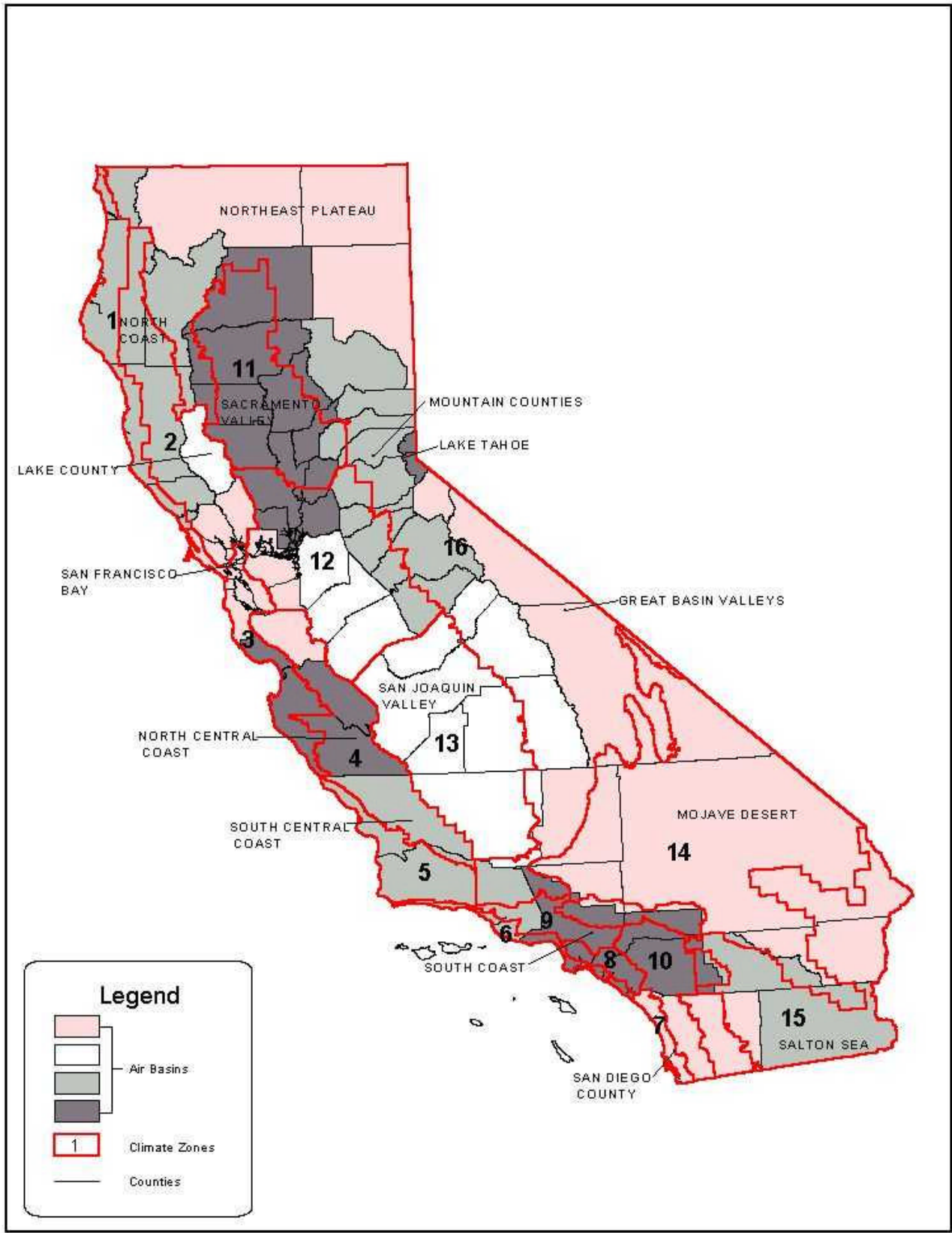
The Commission has performed cost-effectiveness analyses on the proposed changes. These analyses are part of the consultants’ reports, which are listed among the references in Appendix B of this Initial Study (see the Wilcox/Nittler and Eley reports) and are available in conjunction with this Study.

III. NO PROJECT

High demands for electricity on very hot days in California tax the capacity of the electrical grid, and electric utilities sometimes implement rolling blackouts to relieve the strain. Unplanned power outages can occur at these times as well. Reliability of the electricity grid is critical for many businesses in California. KLA-Tencor, for example, a semiconductor equipment manufacturer, determined that a single power outage cost the company \$8 million in lost production, labor, and equipment.³ Also, wholesale electricity prices skyrocket during these periods resulting in costs to utilities that must be passed on to customers if the utility is to stay solvent. In the summer of 2000, soaring wholesale electricity prices caused San Diego Gas and Electric to increase its customers’ rates by a factor of two to three; Pacific Gas and Electric and Southern California Edison to request the CPUC to allow them to obtain reimbursement from customers even though rates are frozen for these utilities; and Sacramento Municipal Utility District to consider an increase in rates for the first time in several years.

³ This figure is from The Power Quality Group, an alliance between E-Source and Electrotek. See Appendix B for the complete citation.

Figure 1 – Map of California Climate Zones and Air Basins



If the Energy Commission did not strengthen the energy efficiency standards for buildings through this expedited rulemaking process, California would miss an opportunity to cut its summer peak demand by over 150 megawatts (MW) and its yearly electricity consumption by 548 gigawatt-hours (GWh).⁴ Also, an annual opportunity to reduce annual release of criteria air pollutants as follows: oxides of nitrogen (NO_x) by 209,895 pounds, PM 10 by 32,881 pounds, and carbon dioxide (CO₂) by 328,800 tons from power plants in the Western United States. In addition, California would not realize a reduction in NO_x by 16,197 pounds and particulate matter (ten microns or smaller - PM10) by 1,636 pounds, and carbon monoxide CO by 3,169 pounds at individual building sites from space heating and water heating systems.

Most traditional types of emergency electricity generators burn fossil fuel, usually diesel or gasoline, and are not easily regulated for release of air pollutants. Reducing the need for emergency generators through the efficient use of energy helps “spare the air” in California and surrounding states.

IV. ENERGY AND ENVIRONMENTAL IMPACTS OF PROPOSED CHANGES

A. Energy Impacts

The proposed efficiency changes were selected to respond to the mandate in AB 970 to “ensure the maximum feasible reductions in wasteful, uneconomic, inefficient, or unnecessary consumption of electricity.” Efficiency improvements under AB 970 will affect an estimated 109,000 homes and 156 million square feet of nonresidential construction in the first year alone (2001). Projections for 2002 and future years indicate higher expected annual construction rates.⁵

Peak demand savings from the proposed changes are estimated at 150 MW, and the total annual savings in electricity use are estimated at 548GWh, for 2001.⁶ Since electricity needs for air conditioning cause most of the strain on the electrical grid, the Commission sought measures to address this problem. The key strategies for reducing electricity use for space cooling that proved cost-effective are reductions in solar heat gains through windows and ceilings, improving duct system efficiency, and improving the installed efficiency of air conditioning equipment. The specific features providing most of the savings are high-performance windows in residences and nonresidential buildings; radiant barriers in attics, low air leakage ducts, and thermostatic expansion valves on cooling equipment in residences; and high efficiency chillers in large commercial buildings. Controls for mechanical and lighting systems and the reduction of lighting loads provide additional savings for nonresidential buildings. The standards also increase the ability to control lighting loads, which is particularly important during peak electricity demand events.

The majority of new construction in California is projected to occur in cooling-dominated climates.⁷ The proposed changes to the energy efficiency standards then will have the greatest effect in those climates.

⁴ From the Wilcox/Nittler and Eley Associates consultants’ report for the AB 970 rulemaking.

⁵ Construction Industry Research Board.

⁶ The new standards also will save an estimated 134,777 MBtu of natural gas for space heating and water heating.

⁷ Construction Industry Research Board.

B. Environmental Impacts

Commission staff completed an environmental checklist to address CEQA issues of this project (see Section VI of the Initial Study). Energy savings result in reduced natural gas burning in both buildings and power plants, thereby reducing air emissions.

The results of this analysis show that implementing the new energy efficiency standards will have no net negative impacts on outdoor or indoor environmental quality. Natural gas emissions reductions occur at individual building sites (in California), and electricity emissions reductions occur at power plants in California and other Western States. The estimated quantities of each type of emissions reductions are shown in Tables 1A and 1B.

Table 1A

REDUCTIONS IN NATURAL GAS USE AND EMISSION BY AIR BASIN AND STATEWIDE				
AIR BASIN	Natural Gas MBTU/yr.	Lbs Nox per year	Lbs PM10 - per year	Lbs of CO per year
North coast	334	33	3	2
Northeast Plateau	2229	221	22	67
Sacramento Valley	16448	1628	164	289
Lake County	-249	-25	-2	-8
San Francisco Bay	37124	3675	371	565
Mountain Counties	20622	2042	206	577
Lake Tahoe	3772	373	38	104
Great Basin Valleys	1021	101	10	30
San Joaquin Valley	17429	1725	174	376
North Central Coast	-2598	-257	-26	-87
South Central Coast	2277	225	23	25
South Coast	34149	3381	341	492
San Diego	5355	530	54	5
Salton Sea	3979	394	40	112
Mojave Desert	21709	2149	217	621
STATEWIDE	163602	16197	1636	3169

Table 1B – Reduction in Electricity Use and Emissions in the Western States

Reduction in Electricity GWh/yr.	NO _x lbs/yr.	PM10 lbs/yr.	CO ₂ tons/yr.
548	209,895	32,881	328,800

Sources for Tables 1A and 1B: Calculated from data from the California Air Resources Board, California Department of Finance, Construction Industry Research Board, and the Wilcox/Nittler and Eley reports. See Appendix B, References, for complete citations.

During the environmental impact analysis, issues surfaced that called for further study:

1. The improvements in the solar heat gain coefficient (SHGC) of windows in both the residential and nonresidential standards, in combination with cool roofs or radiant barriers, reduce solar heat gains to buildings during the summer, providing a net reduction in emissions from electric generation in California and the Western United States during the cooling season. However, these same measures also reduce *desirable*

solar gain in winter, potentially increasing the need for space heating by natural gas and increasing NO_x and PM10 emissions.

Energy Commission staff evaluated energy and emissions impacts of the changes by climate zone. This data was then converted to reflect the impact of the changes by air basin as they correlate to climate zones (refer to Figure 1 for a map of air basins and climate zones). Staff then multiplied the energy use from air basins by the emissions factors (Table 2 for furnaces) per unit of energy for NO_x, CO and PM10 shown in Table 1A to determine the emissions for each air basin. The process was repeated for NO_x, CO₂ and PM10 Table 1B for the western states using Table 2 values for electric generation.

Table 2 - Emissions Factors for Electric Generation and Furnaces				
	NO_x	CO	CO₂^{3,4}	PM10
Emissions Factor for Electric Generation¹	.383 lbs./MWh	.23 lbs./MW	1200lbs/MWh	.06 lbs./MWh
Emissions Factor for Use of Furnaces²	.099 lbs./MBtu	.03 lbs./Mbtu	115lbs/Mbtu	.01 lbs./Mbtu

Table 2 notes:

¹ Electric generation emissions factors are from Pat McAuliffe, California Energy Commission, July 1996.

² Gas furnace emissions factors for NO_x are from Rob Hudler, California Energy Commission, and for CO and PM 10 are from Cindy Greenwald, South Coast Air Quality Management District, September 1995.

³ Gas furnace emission factors for CO₂ are from Cole, J. and Zawacki, T., 1985.

⁴ Electric generation emission factors for CO₂ are from Matthew Laton, January, 2001

The analysis showed that the potential increase in emissions statewide from increased winter heating due to reduced solar gain was totally offset by the new requirements for tight ducts and lower fenestration U-values, both of which reduce winter heating energy use. The same was true for individual air basins except Lake County and North Central Coast. While the analysis showed a decrease in emissions (in California and the Western United States) due to electricity savings in the summer, the Lake County Air Basin (LCAB) data showed a small net increase in emissions during the winter: 25 pounds of NO_x and 2 pounds of PM10 per year due to an increase in the combustion of natural gas (or propane) during the winter heating season (Table 1A). Similarly the North Central Coast Air Basin (NCCAB) showed a small net increase during the winter: 257 pounds NO_x and 26 pounds of PM10 per year.

The LCAB has been and continues to be in attainment for all criteria air pollutants.⁸ The Lake County Air Quality Management District (LCAQMD) administers an air quality management plan that includes growth factors for new residential and nonresidential construction and measures for addressing air quality consequences. The existing inventory of pollution sources contains estimates of emissions of NO_x at 6 *tons per day* and of PM10 at 10 *tons per day* in Lake County from all sources. The increase emissions due to the Standards represents 0.00057% and 0.00003% of the existing Lake County inventory for NO_x and PM10 respectively.

⁸ California Air Resources Board.

The NCCAB has not been able to attain all criteria for air pollutants. The NCCAB's existing inventory of pollution sources contains estimates of emissions of NO_x at 73 tons per day and of 74 tons per day of PM10. The increase in emissions due to the Standards represents 0.0005% and 0.00005% of the existing North Central Coast inventory for NO_x and PM10 respectively.

The proposed energy efficiency changes do not alter the forecasts for quantity of new construction, but they will affect some of the energy measures in that new construction. Since LCAQMD's and NCCAB's planning addresses growth, and the amount of estimated new emissions is negligible compared to existing emissions, staff concludes that the proposed energy efficiency changes will not create a significant impact on the LCAB and NCAAB.

2. Under the proposed changes, assembly spaces (such as theaters) would be required to have demand control ventilation, a strategy to reduce ventilation rates at times of low occupancy, which might have implications for the indoor air quality in those spaces. The required airflow rates for assembly spaces are 0.5 cubic feet per minute (cfm) or more at all times. Under the current standards, demand control ventilation is an alternative compliance approach to this requirement that allows lowering the airflow to 0.15 cfm when the spaces are unoccupied. Under the proposed standards changes, this compliance option would become mandatory for assembly spaces. While assembly spaces make up a very small portion of total floor space additions in California, further consideration of indoor air quality in these spaces was warranted.

Staff concludes that requiring demand control ventilation in assembly spaces has no impact on indoor air quality when the space becomes occupied. The requirements for CO₂ sensors that monitor air quality and control ventilation rates are identical to the criteria used in the alternative approach in the current standards. Demand control ventilation is also recognized as an appropriate ventilation strategy for meeting the requirements of ASHRAE 62-1989, Ventilation for Acceptable Indoor Air Quality. The Standards require that the sensors be able to be set so that when CO₂ levels rise above 800 parts per million (PPM), ventilation rates increase immediately to occupancy-level requirements. Therefore, the proposed mandatory requirement would not change existing ventilation rates in assembly spaces when occupied, and would not reduce the air quality in those spaces.

V. Conclusions and Recommendations

Since the analysis for the proposed changes to energy efficiency standards has shown that there will be no significant impact on the environment, staff recommends approval of the changes to help alleviate California's electricity crisis in the coming years.

VI. Environmental Checklist

Project title:	AB 970 Energy Efficiency Standards for Residential and Nonresidential Buildings
Lead agency name and address	California Energy Commission 1516 Ninth Street Sacramento, California 95814
Contact person and phone number:	<ul style="list-style-type: none"> ▪ Tony Rygg, Efficiency Standards CEQA Project Manager, Energy Efficiency Division, (916) 653-7271 ▪ Connie Bruins, CEQA Project Manager, Environmental Division, (916) 654-4545
Project Description	The Commission is proposing changes to the energy efficiency standards for residential and nonresidential buildings as mandated by AB 970. A list of the proposed changes is included in Appendix A of this Initial Study.
Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement.)	The California Building Standards Commission must approve the changes.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

	I. Aesthetics		II. Agriculture Resources	x	III. Air Quality
	IV. Biological Resources		V. Cultural Resources		VI. Geology /Soils
x	VII. Energy		VIII. Hazards & Hazardous Materials		IX. Hydrology / Water Quality
	X. Land Use/ Planning		XI. Mineral Resources		XII. Natural Resources
	XIII. Noise		XIV. Population/ Housing		XV. Public Services
	XVI. Recreation		XVII. Transportation/ Traffic		XVIII. Utilities/Service Systems
x	XIX. Mandatory Findings of Significance				

Issues:

	Potential-ly Signifi- cant Im- pact	Less Than Significant with Mitiga- tion Incor- poration	Less Than Signifi- cant Impact	No Im- pact
I. AESTHETICS -- Would the project:				
a) Have a substantial adverse effect on a scenic vista?				X
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				X
c) Substantially degrade the existing visual character or quality of the site and its surroundings?				X
d) Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?				X
Improvements in the energy efficiency of residential and nonresidential buildings will have no impact to any of the concerns listed above.				
II. AGRICULTURE RESOURCES -- In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				X
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				X
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?				X
Improvements in the energy efficiency of residential and nonresidential buildings will have no impact to any of the concerns listed above.				
III. AIR QUALITY -- Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?				X
b) Violate any air quality standard or contribute substantially to an existing or				X

	Potential-ly Signifi- cant Im- pact	Less Than Significant with Mitiga- tion Incor- poration	Less Than Signifi- cant Impact	No Im- pact
projected air quality violation?				
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?				X
d) Expose sensitive receptors to substantial pollutant concentrations?				X
e) Create objectionable odors affecting a substantial number of people?				X
Improvements in the energy efficiency of residential and nonresidential buildings will have no impact to the concerns listed above. The building standards changes taken cumulatively will result in reduced power plant operation (in California and the Western United States) and will reduce the need to build power plants in the future. The proposed standards remain consistent with current methods for maintaining indoor air quality with ventilation. See discussion in Section IV of this Initial Study.				
IV. BIOLOGICAL RESOURCES -- Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?				X
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?				X
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?				X
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?				X

	Potential-ly Signifi- cant Im- pact	Less Than Significant with Mitiga- tion Incor- poration	Less Than Signifi- cant Impact	No Im- pact
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				X
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?				X
Improvements in the energy efficiency of residential and nonresidential buildings will have no impact to any of the concerns listed above.				
V. CULTURAL RESOURCES -- Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in '15064.5?				X
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to '15064.5?				X
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?				X
d) Disturb any human remains, including those interred outside of formal cemeteries?				X
Improvements in the energy efficiency of residential and nonresidential buildings will have no impact to any of the concerns listed above.				
VI. GEOLOGY AND SOILS -- Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				X
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.				X
ii) Strong seismic ground shaking?				X
iii) Seismic-related ground failure, including liquefaction?				X
iv) Landslides?				X
b) Result in substantial soil erosion or the loss of topsoil?				X
c) Be located on a geologic unit or soil that is unstable, or that would become				X

	Potential-ly Signifi- cant Im- pact	Less Than Significant with Mitiga- tion Incor- poration	Less Than Signifi- cant Impact	No Im- pact
unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?				
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?				X
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?				X
Improvements in the energy efficiency of residential and nonresidential buildings will have no impact to any of the concerns listed above.				
VII. ENERGY -- Would the project:				
a) Use exceptional amounts of fuel or energy?				X
b) Increase demand upon existing sources of energy, or require the development of new sources of energy?				X
Improvements in the energy efficiency of residential and nonresidential buildings will have no impact to the concerns listed above. The building standards changes taken cumulatively result in reduced energy use. See discussion in Section IV of the Initial Study.				
VIII. HAZARDS AND HAZARDOUS MATERIALS -- Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?				X
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?				X
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				X
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				X
e) For a project located within an airport				

	Potential-ly Signifi- cant Im- pact	Less Than Significant with Mitiga- tion Incor- poration	Less Than Signifi- cant Impact	No Im- pact
land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?				X
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				X
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				X
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?				X
Improvements in the energy efficiency of residential and nonresidential buildings will have no impact to any of the concerns listed above.				
IX. HYDROLOGY AND WATER QUALITY -- Would the project:				
a) Violate any water quality standards or waste discharge requirements?				X
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?				X
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?				X
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?				X

	Potential-ly Signifi- cant Im- pact	Less Than Significant with Mitiga- tion Incor- poration	Less Than Signifi- cant Impact	No Im- pact
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?				X
f) Otherwise substantially degrade water quality?				X
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				X
h) Place within a 100-year flood hazard area structures that would impede or redirect flood flows?				X
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?				X
j) Inundation by seiche, tsunami, or mudflow?				X
Improvements in the energy efficiency of residential and nonresidential buildings will have no impact to any of the concerns listed above.				
X. LAND USE AND PLANNING -- Would the project:				
a) Physically divide an established community?				X
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?				X
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?				X
Improvements in the energy efficiency of residential and nonresidential buildings will have no impact to any of the concerns listed above.				
XI. MINERAL RESOURCES -- Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				X
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local				X

	Potential-ly Signifi-cant Im-pact	Less Than Significant with Mitiga-tion Incor-poration	Less Than Signifi-cant Impact	No Im-pact
general plan, specific plan or other land use plan?				
Improvements in the energy efficiency of residential and nonresidential buildings will have no impact to any of the concerns listed above.				
XII. NATURAL RESOURCES -- Would the project result in:				
a) Significant increase in the rate of use of any natural resources?				X
b) Significant depletion of any non-renewable natural resource?				X
Improvements in the energy efficiency of residential and nonresidential buildings will have no impact to any of the concerns listed above.				
XIII. NOISE -- Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?				X
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?				X
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?				X
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?				X
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				X
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				X
Improvements in the energy efficiency of residential and nonresidential buildings will have no impact to any of the concerns listed above.				
XIV. POPULATION AND HOUSING -- Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and				X

	Potential-ly Signifi- cant Im- pact	Less Than Significant with Mitiga- tion Incor- poration	Less Than Signifi- cant Impact	No Im- pact
businesses) or indirectly (for example, through extension of roads or other infrastructure)?				
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				X
Improvements in the energy efficiency of residential and nonresidential buildings will have no impact to any of the concerns listed above.				
XV. PUBLIC SERVICES -- Would the project:				
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				X
Fire protection?				X
Police protection?				X
Schools?				X
Parks?				X
Other public facilities?				X
Improvements in the energy efficiency of residential and nonresidential buildings will have no impact to any of the concerns listed above.				
XVI. RECREATION -- Would the project:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				X
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?				X
Improvements in the energy efficiency of residential and nonresidential buildings will have no impact to any of the concerns listed above.				

	Potential-ly Signifi- cant Im- pact	Less Than Significant with Mitiga- tion Incor- poration	Less Than Signifi- cant Impact	No Im- pact
XVII. TRANSPORTATION AND TRAFFIC -- Would the project:				
a) Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?				X
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?				X
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				X
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				X
e) Result in inadequate emergency access?				X
f) Result in inadequate parking capacity?				X
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?				X
Improvements in the energy efficiency of residential and nonresidential buildings will have no impact to any of the concerns listed above.				
XVIII. UTILITIES AND SERVICE SYSTEMS -- Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				X
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X
d) Have sufficient water supplies available to serve the project from				X

	Potential-ly Signifi-cant Im-pact	Less Than Significant with Mitiga-tion Incor-poration	Less Than Signifi-cant Impact	No Im-pact
existing entitlements and resources, or are new or expanded entitlements needed?				
e) Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the projects projected demand in addition to the providers' existing commitments?				X
f) Be served by a landfill with sufficient permitted capacity to accommodate the projects solid waste disposal needs?				X
g) Comply with federal, state, and local statutes and regulations related to solid waste?				X
Improvements in the energy efficiency of residential and nonresidential buildings will have no impact to any of the concerns listed above.				
XIX. MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?				X
c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?				X
Improvements in the energy efficiency of residential and nonresidential buildings will have no impact to the concerns listed above. The building standards changes taken cumulatively result in reduced power plant operation and reduce the need to build power plants in the future in California and the Western States. See discussion in Section IV of this Initial Study.				

DETERMINATION:

On the basis of this evaluation:

X	I find that the proposed project WILL NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
	I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
	I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
	I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
	I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

STEVE LARSON
Executive Director
California Energy Commission

Date

Appendix A - Summary of Proposed Changes to Energy Efficiency Standards under AB 970

(Matrix on following pages)

A. Residential Building Standards					
		Proposed Measure	Description of Measure	Expected Energy Consequence	Potential Environmental Issues
	1	Low-solar gain, low emissivity (LSLE) fenestration	Expand the current SHGC requirement of 0.40 to include all orientations in climate zones 2, 4, and 7-15. All other climate zones remain at current levels. Increase U-value to 0.65 in climate zone 10. All other climate zones remain at current levels.	Reduced summer peak electricity demand.	None. Reduced power plant emissions.
	2	Duct sealing	Require heating and cooling system ducts in new houses to be sealed in all climate zones.	Reduced summer peak electricity demand and reduced winter natural gas demand.	None. Reduced emissions from power plants (summer) and furnaces (winter).
	3	Thermostatic expansion valves (TXV) for central air conditioners	Require thermostatic expansion valves in new central air conditioners in climate zones 2 and 8-15.	Reduced summer peak electricity demand.	None. Reduced power plant emissions.
	4	Radiant barriers	Require radiant barriers in climate zones 2, 4, and 8-15.	Reduced summer peak electricity demand.	None. Reduced power plant emissions.
	5	Remove credit for interior shading devices	Eliminate interior shading devices for achieving compliance with efficiency standards. This change will eliminate the compliance credit for devices subject to inconsistent operation and compliance problems. This results in more reliable energy savings.	Reduced summer peak electricity demand.	None. Reduce power plant emissions.
	6	Extend duct efficiency compliance credit to low-rise multi-family buildings	Create compliance credit for improved duct efficiency, thereby encouraging improved duct design, sealing and installation in low-rise multi-family buildings.	Potential for reduced summer peak electricity demand and natural gas use for space heating in winter.	None. Potential for reduced power plant and furnace emissions.

A. Residential Building Standards					
		Proposed Measure	Description of Measure	Expected Energy Consequence	Potential Environmental Issues
	7	Compliance credit for cool roofs	Create a compliance credit for installation of reflective roof products.	Potential reduced summer peak electricity demand.	None. Potential for reduced power plant emissions.
	8	Change air conditioning modeling assumptions for efficiency to reflect typical refrigerant charge, airflow and fan wattage, and temperature related air conditioner performance	Improve accuracy of compliance modeling of installed air conditioner performance and create compliance credit for TXVs and potential for future compliance credit for other improvements to installed air conditioner performance.	Potential for reduced summer peak electricity demand.	None. Potential for reduced power plant emissions.

B. Nonresidential Building Standards					
		Proposed Measure	Description of Measure	Expected Energy Consequence	Potential Environmental Issues
ASHRAE 90.1-based measures					
	1	FENESTRATION - Efficiency	Use ASHRAE 90.1 method to update requirements for glazing SHGC and U-value to match current technology level and cost effectiveness.	Reduced summer peak electricity demand, decreased electricity use for cooling, and lowered natural gas use for winter heating.	None. Summer: reduced power plant emissions. Winter Lowered emissions from decreases in natural gas combustion for space heating.
	2	LIGHTING			
	2A	Lighting Power Densities (LPDs)	Reduce lighting levels in the Area Method Categories and in the Whole Building Method; LPD will match those in the ASHRAE 90.1 standard.	Reduced summer peak and year-round electricity demand.	None. Reduced power plant emissions.
	2B	Bi-Level Switching and Occupancy Sensors	Remove blanket exemption for bi-level switching when occupancy sensors or automatic controls are installed. Extend bi-level controls to <5000 square feet.	Reduced summer peak and year-round electricity demand.	None. Reduced power plant emissions.
	2C	Exterior Lighting	Create requirements for minimal allowed efficiency level for exterior lighting.	Reduced year-round electricity demand.	None. Reduced power plant emissions.
	2D	Delete lumen maintenance control credits	Remove lighting credit for installing lumen maintenance controls for higher installed lighting levels.	Small decrease in electric demand for lighting.	None.

B. Nonresidential Building Standards					
		Proposed Measure	Description of Measure	Expected Energy Consequence	Potential Environmental Issues
	3	HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)			
	3A	Air-side economizer trade-off	Allow a tradeoff using higher efficiency cooling equipment instead of an economizer. Higher efficiency cooling equipment expected to produce more reliable energy savings than economizer.	Reduced summer peak and off-peak electricity demand.	None. Reduced power plant emissions.
	3B	Air-side Economizer High Limit Switch Control	Limit the type of controls that can be used on economizers; increases the reliability of operation of economizers.	Potential increased reliability, small measurable effect.	None.
	3D	HVAC Efficiency	Increase efficiency requirements for larger space conditioning systems to match values adopted by ASHRAE; includes forced air furnace requirements to reduce standby loss.	Reduced summer peak and off-peak electricity demand and some reduction in natural gas use.	None. Reduced power plant emissions and some reduction in emissions due to natural gas combustion for space heating and water heating.
	4	ROOFING - Cool Roof Compliance Option	Create compliance credit for “cool roofs.”	Potential for reduced peak demand and reduced electricity consumption in summer.	None. Potential for reduced power plant emissions.
Non-ASHRAE Measures					
	5	HVAC pipe and duct insulation	Clarify the requirement to protect ducts and piping from the impacts of weather and solar radiation.	Potential for reduced peak electricity demand and reduced natural gas use.	None.

B. Nonresidential Building Standards

		Proposed Measure	Description of Measure	Expected Energy Consequence	Potential Environmental Issues
	6	Commercial Fenestration Product Rating and Labeling	For large nonresidential buildings, site-built fenestration products must be rated and labeled under the National Fenestration Rating Council 100-SB method.	Potential for increased reliability of savings for electricity and natural gas.	None.
	7	Demand control ventilation	Require demand control ventilation for assembly occupancies; reduces ventilation in assembly occupancies when not occupied and not needed.	Reduces summer peak electricity demand and off-peak electricity consumption.	None. Since the system only shuts the system off during times when the building is not occupied there are no negative impacts on indoor air quality.
	7	Furniture-based lighting	Clarify current requirement wording for lighting levels in open offices with furniture-based lighting systems.	Reduces summer peak electricity demand and off-peak electricity consumption for these buildings.	None. Reduced power plant emissions.
	8	Duct sealing for package single-zone HVAC systems	Create compliance credit for duct sealing and insulation.	Potential to reduce summer peak electricity demand and use of natural gas for heating in winter.	None. Summer: potential reduced power plant emissions. Winter: potential decreased emissions from natural gas combustion for space heating.

C. Cumulative Effects of Proposed Energy Efficiency Standards Changes, Residential and Nonresidential – Energy and Emissions Savings					
Estimated Energy Consequences			Estimated Environmental Consequences		
Energy reductions expected in the first year (2001)			Emissions reductions expected in the first year (2001)		
Electricity		Natural Gas		Electricity	Natural Gas
Usage reduction	548 GWh	134,777 MBtu	NO _x	209,895 lbs.	16,197 lbs.
Peak demand reduction	150 MW		CO ₂	328,800 tons/yr.	7,750 tons/yr.
			CO	126,046 lbs.	3,169 lbs.
			PM10	32,881lbs.	1,636 lbs.
			NOTE: Electricity emissions reductions occur at power plants in California and other Western States, and natural gas emissions reductions occur at individual building sites.		
Projections for future years indicate more square feet of new construction per year than estimated for 2001. [Construction Industry Research Board] Therefore, these figures are expected to increase each year.					

Appendix B – References

- AB 970 Residential Building Energy Efficiency Standards Analysis***, Bruce Wilcox, Berkeley Solar Group, and Ken Nittler, Enercomp, Inc. prepared for the California Energy Commission, Sacramento, California, November 2000.
- Assembly Bill 970, The California Energy Security and Reliability Act of 2000***, approved by the Governor on September 6, 2000, and filed with the Secretary of State September 7, 2000.
- Assembly Bill 970 Emergency Rulemaking – 2001 Update of California Nonresidential Building Energy Efficiency Standards***, Eley Associates, San Francisco, California, prepared for the California Energy Commission, Sacramento, California, November 2000.
- California Construction Review***, Construction Industry Research Board, Burbank, California, 1999.
- California Statistical Abstract*** California Department of Finance, , Sacramento, California, October 2000. Available at http://www.dof.ca.gov/html/fs_data/STAT-ABS/sec_I.htm.
- Energy Efficiency Standards for Residential and Nonresidential Buildings***, California Energy Commission, Publication Number P400-98-001, Sacramento, California, July 1999. Available on the Commission's website at <http://www.energy.ca.gov/reports/index.html>.
- The Rising Profile of Power Quality – Market Highlights***, The Power Quality Group (an E-Source/Electrotek Power Quality Alliance), <http://pqgroup.com/highlights.html>, date of publication not given.
- Ventilation for Acceptable Indoor Air Quality***, American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. (ASHRAE), ASHRAE Standard 62-1989, Atlanta, Georgia, 1989.
- 1997 Uniform Building Code***, International Conference of Building Officials, Whittier, California, April 1997.
- The 1999 California Almanac of Emissions and Air Quality***, California Air Resources Board, Planning and Technical Support Division, Sacramento, California, date of publication not given.
- Emissions from Residential Gas-Fired Appliances, Topical Report from the Institute of Gas Technology***, GRI0-84/0165) Cole, J. and Zawacki, T (1985).

Appendix C – Glossary of Terms

Alternative Calculation Method (ACM)

An alternative calculation method is one of “the Commission's Public Domain Computer Programs, one of the Commission's Simplified Calculation Methods, or any other calculation method approved by the Commission.”[*BEES*, Section 101]

Alternative Component Packages

An alternative component package is one of the sets of prescriptive requirements contained in Section 151(f) and Tables 1-Z1 through 1-Z16 of the Standards (Chapter 3) which a building may meet to achieve compliance with the standards. These are often referred to as the “prescriptive packages” or “packages.”

ASHRAE

American Society of Heating, Refrigerating and Air Conditioning Engineers.

ASTM

American Society for Testing and Materials.

BEES

See Building Energy Efficiency Standards

Bi-Level Switching

Lighting controls that allow a portion of the lights to be turned off while maintaining balanced lighting throughout a space.

Btu/hr (Btuh)

British thermal unit per hour. One Btu equals the amount of heat needed to raise the temperature of one pound of water one degree Fahrenheit. Used for measuring heating and cooling equipment output.

Building Energy Efficiency Standards (EES)

The California State energy standards as set forth in the California Code of Regulations, Title 24, Part 6.

Climate Zone

The Energy Commission established 16 climate zones that represent a geographic area for which an energy budget is established. These energy budgets are the basis for the energy efficiency standards. Following is a list of a major city in each climate zone:

CZ01: Arcata	CZ07: San Diego	CZ12: Sacramento
CZ02: Santa Rosa	CZ08: El Toro	CZ13: Fresno
CZ03: Oakland	CZ09: Pasadena	CZ14: China Lake
CZ04: Sunnyvale	CZ10: Riverside	CZ15: El Centro
CZ05: Santa Maria	CZ11: Red Bluff	CZ16: Mount Shasta
CZ06: Los Angeles		

Cool Roofs

A roof that reflects significantly more solar energy than a traditional roof and therefore keeps the building's interior cooler. Cool roofs are usually light-colored and applied as a tile product (residential) or coating (nonresidential). An alliance called the Cool Roof Rating Council has been formed to establish criteria and rating systems for cool roofs.

CO

Carbon Monoxide (CO): A colorless, odorless gas resulting from the incomplete combustion of hydrocarbon fuels. CO is regulated as a primary pollutant.

CO₂

Carbon dioxide, A gas by-product of combustion that is known to behave as a greenhouse gas in the earth's atmosphere.

Demand Control Ventilation

Demand Control Ventilation is the ability to adjust the amount of ventilation air provided to a space based on the extent of occupancy (as measured by CO₂ sensors). An assembly building that is occupied on an intermittent basis would use demand controls to change the ventilation rates based on the number of people in the space, thereby saving substantial energy when the space is sparsely occupied. Occupancy sensors, air quality sensors, or other devices may accomplish this.

EER (Energy Efficiency Ratio)

The ratio of cooling capacity of an air conditioning unit in Btus per hour to the total electrical input in watts under specified test conditions. Compare to *SEER*.

Emissivity

The property of emitting radiation; possessed by all materials to a varying extent.

Energy Budget

"Energy budget is the maximum amount of source energy that a proposed building, or portion of a building, can be designed to consume, calculated with the approved procedures specified in Title 24, Part 6." [*BEES*, Section 101]

Fenestration Product

A fenestration product is "any transparent or translucent material plus any sash, frame, mullions, and dividers, in the envelope of a building, including, but not limited to: windows, sliding glass doors, French doors, skylights, curtain walls, garden windows, and other doors with a glazed area of more than one-half of the door area." [*BEES*, Section 101]

Gigawatt-hour (GWh)

One thousand megawatt-hours, one million kilowatt-hours, or one billion watt-hours of electrical energy.

Glazing

Transparent or translucent material (typically glass or plastic) used for admitting light.

Heating, Ventilating and Air Conditioning (HVAC)

The mechanical heating, ventilating and air conditioning system of the building is also known as the HVAC system. The standards use various measures of equipment efficiency defined according to the type of equipment installed.

Kilowatt (kW)

One thousand watts of power. A kilowatt is a measure of demand, or how many thousand watts are being drawn at any instant.

Kilowatt-hour (kWh)

One thousand watt-hours of energy.

Lighting Power Density (LPD)

A measure of the amount of light in a room. For the purpose of this document, LPD represents the amount of watts per square foot of lighting that can be installed for a specific task.

Low-e glazing

Glazing that has been coated with a low-emissivity medium that reduces heat transfer.

Low-Rise Residential

Any building of the residential occupancy group R (as defined in the Uniform Building Code), excluding all hotels, all motels and apartment buildings, with four or more habitable stories.

Megawatt (MW)

One million watts of power. A megawatt is a measure of demand or how many million watts are being drawn at any instant (*see also* kilowatt).

MBtu

One million Btus of energy.

NFRC

The National Fenestration Rating Council, a national organization of manufacturers of fenestration products, glazing and related materials, utilities, state energy offices, laboratories, homebuilders, architects and public interest groups. This organization is responsible for rating the U-values and solar heat gain coefficient of manufactured fenestration product lines (i.e., windows, skylights, and glazed doors) that must be used in compliance calculations. In California, all manufactured fenestration products must be labeled with NFRC rated values or with approved default U-values.

NO_x

Oxides of nitrogen, usually NO and NO₂, that are chief components of air pollution and produced by the combustion of fossil fuels.

Outside Air

"Outdoor air is air taken from outdoors and not previously circulated in the building." [BEES, Section 101]

Proposed Design

The proposed building designs that must comply with the standards before receiving a building permit.

PM10

Solid particulate matter that is 10 microns in size or smaller. Usually considered pollutants, particulates are released from combustion processes in exhaust gases at fossil fuel plants and from mobile and other fugitive particle sources.

Radiant Barriers

Reflective material installed on or below the underside of the roof to block radiant gain from a solar-heated, hot roof to keep from raising attic temperatures and increasing conduction through duct and ceiling insulation.

SEER (Seasonal Energy Efficiency Ratio)

The total cooling output of a central air conditioning system in Btus during its normal usage period for cooling divided by the total electrical input in watt-hours during the same period, as determined using specific test procedures.

Solar Heat Gain Coefficient (SHGC)

A measure of the effectiveness of a fenestration product or window covering to stop solar heat gain through the window. SHGC is the “ratio of the solar heat gain entering the space through the fenestration area to the incident solar radiation. Solar heat gain includes directly transmitted solar heat and absorbed solar radiation, which is then reradiated, conducted, or convected into the space.” [BEES, Section 101]

Standards

The *California Building Energy Efficiency Standards* as set forth in the *California Code of Regulations*, Title 24, Part 6.

Thermostatic Expansion Valve (TXV)

A refrigerant metering valve that controls the flow of liquid refrigerant entering the evaporator in response to the superheat of the gas leaving it. Its basic function is to keep the evaporator active without permitting liquid to be returned through the suction line to the compressor. TXVs compensate for common installation problems caused by incorrect refrigerant charge and incorrect airflow.

U-value

A measure of energy efficiency of a wall assembly or fenestration, defined as the “overall coefficient of thermal transmittance of a construction assembly, in Btu/(hr x ft² x °F), including air film resistances at both surfaces.” [BEES, Section 101]

Ventilation Air

"Ventilation air is that portion of supply air which comes from outside plus any recirculated air that has been treated to maintain the desired quality of air within a designated space."
[BEES (1998), Section 101]

Watt (W)

A unit of measure of electric power at a point in time, as capacity or demand.

Watt-hour (Wh)

One watt of power expended for one hour.

PROPOSED NEGATIVE DECLARATION

AB 970 ENERGY EFFICIENCY STANDARDS FOR RESIDENTIAL AND NONRESIDENTIAL BUILDINGS

On September 6, 2000, Governor Gray Davis signed emergency legislation, Assembly Bill 970, the California Energy Security and Reliability Act of 2000. The purpose of this legislation was to provide a balanced response to the state's electricity problems, to create significant investments in new, environmentally superior electricity generation, and to increase new investments in conservation and demand-side management programs to meet future energy needs of the State of California. Among other items, the bill provides the following direction to the Energy Commission:

“Public Resources Code 25553. Notwithstanding any other provision of law, on or before 120 days after the effective date of this section or on the earliest feasible date thereafter, the commission shall take...the following actions:

...

(b) Adopt and implement updated and cost-effective standards pursuant to Section 25402 to ensure the maximum feasible reductions in wasteful, uneconomic, inefficient or unnecessary consumption of electricity.”

This document is part of the expedited rulemaking process for amending California's current standards for energy efficiency in residential and nonresidential buildings, as mandated in AB 970. The Energy Commission developed these standards, codified as Title 24, Part 6 of the California Code of Regulations, and has been maintaining them since 1978. Normally, the standards are amended as part of the State Building Code, which is published every three years. The strain on the electrical supply system in 2000 created an urgent situation, and AB 970 calls for a 120-day process for strengthening the standards.

PROPOSED FINDING

The analysis for the proposed changes to energy efficiency standards indicates no significant impact on the environment. The Commission finds that the adoption of the proposed standards, including amendments and repeals of existing standards, will result in no significant adverse environmental effect. The attached initial Study and Environmental Checklist documents this finding.

WILLIAM J. KEESE
Chair
California Energy Commission

DATE:_____

MICHAEL C. MOORE
Commissioner
California Energy Commission

DATE:_____

ROBERT A. LAURIE
Commissioner
California Energy Commission

DATE:_____

ROBERT PERNELL
Commissioner
California Energy Commission

DATE:_____

ARTHUR H. ROSENFELD
Commissioner.
California Energy Commission

DATE:_____